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Short communication

Endoscopic endonasal surgery of posterior choanal atresia

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Abstract
The use of the rigid endoscope in the management of posterior choanal atresia represents a significant advancement in choanal surgery. It provides an extremely sharp image with a magnified overview. It enables the surgeon to see the tips of his instruments, so that the bone is removed safely under direct endoscopic vision. It allows assessment of the size of the opening, in comparison to the normal choana. It ensures greater precision in flap preservation. The technique is short in time and safe, with early recovery and short hospitalization.

Introduction

Posterior choanal atresia is one of the more commonly observed congenital anomalies of the nose. The obstructing barrier may be bony (90 per cent) or membranous (10 per cent). In most cases, it is thin and easily perforated; occasionally it is formed by thick dense bone (Cinnamond, 1987). It is generally sited just in front of the posterior end of the nasal septum. The anatomy of the atretic plate is such that it lies obliquely across the nasal cavity.

Failure to pass a rubber catheter through either side of the nose into the nasopharynx makes a presumptive diagnosis of choanal atresia. The diagnosis can be confirmed by contrast choanography and computerized tomography (Wetmore and Mahboubi, 1986).

The essential aim of treatment of choanal atresia is surgical creation of a patent nasal airway. Four different approaches have been described: (1) transnasal, (2) transpalatal, (3) trans-septal and (4) transantral. The transpalatal approach was the one most commonly practiced because it gave better visualization during atretic bone removal (English, 1981). However, much has been written about the restricting effect of the palatal incision in children on lateral maxillary growth (Pashley, 1986) and on development of upper dental arch (Pirsig, 1986). There is also a risk of palatal perforation if the palatal flap is short (Cinnamond, 1987).

In this report, we have used the rigid endoscope in the management of posterior choanal atresia.

Technique

The operation was done under general anaesthesia with oral endotracheal intubation. We used Storz rigid endoscopes 18 cm long, 4.0 mm external diameter and with 0°, 30° and 120° deflection angles. The endoscope was passed first into the normal nasal cavity to evaluate the size of the normal choana (by the 0° telescope) and to examine the nasopharyngeal surface of the atretic plate (by the 120° telescope). The 0° endoscope was then introduced along the middle meatus of the obstructed side to examine the nasal cavity and the atretic plate. The nasal mucosa over the atretic plate was infilterated with adrenaline 1: 100,000 and lignocaine 2 per cent. An upward-based rectangular flap was elevated from the nasal surface of the atretic plate using a sickle knife, a micro-dissector and suction tips (Fig. 1). A slim chisel was then passed along

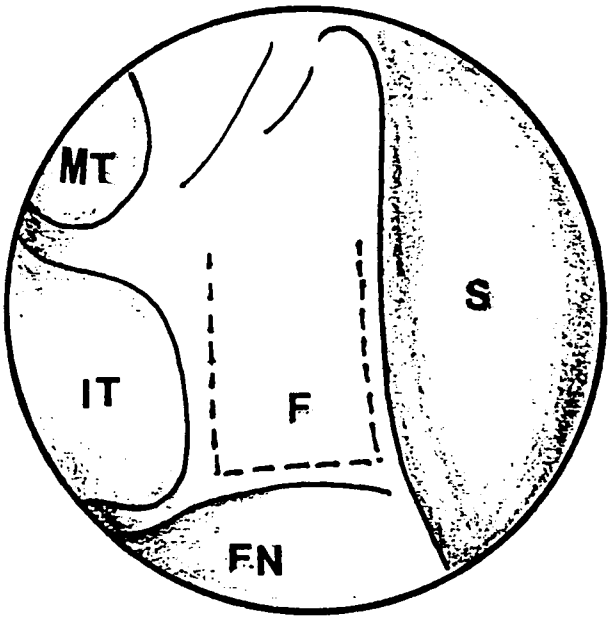

Fig. 1
An upward based rectangular flap (F) was elevated from the nasal surface of the atretic plate (S = septum, IT = posterior end of inferior turbinate, MT = posterior end of middle turbinate, FN = floor of the nose).

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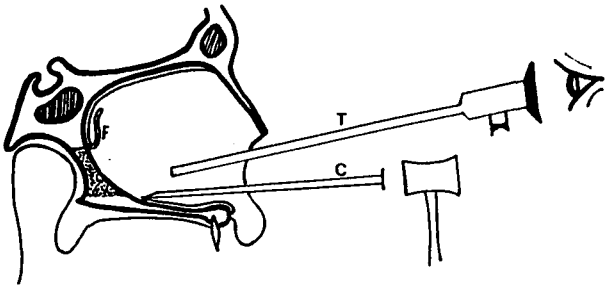

Fig. 2

The telescope (T) was inserted along the middle meatus and a slim chisel (C) was passed along the floor of the nose to the level of the atretic plate (F = elevated nasal mucosal flap).

the floor of the nose to the level of the occluding plate (Fig. 2). Since the atretic plate is, almost always, thinnest and weakest at the junction of the floor of the nose and posterior end of the septum (Cinnamond, 1987), the tip of the chisel should be hinged at that point. The chisel was rotated to direct the perforating force safely downwards and medially, away from the basisphenoid. The bone of the plate was removed under endoscopic vision by four chisel cuts (Fig. 3). The perforation of the atretic plate can guided by an assistant's finger inserted behind the soft palate, or by a 120° nasopharyngoscope introduced through the normal nasal cavity or through the oral cavity (Winther, 1978), so as to prevent damage to the posterior pharyngeal wall and cervical spine. The opening may be widened by a Lempert curette. The size of the created opening was dictated by the age of the patient and compared to the normal choana. If the nasopharyngeal mucous membrane on the posterior surface of the obstruction remained intact, it was incised in a stellate fashion by the sickle knife. The nasal mucosal flap was rotated posteriorly to cover the raw area left by removal of the obstructing bone. A Portex tube that approximated the diameter of the external nares was inserted through the nasal cavity into the nasopharynx. Its anterior end was sutured to the membranous part of the septum, behind the columella. It was left in place for 6–8 weeks.

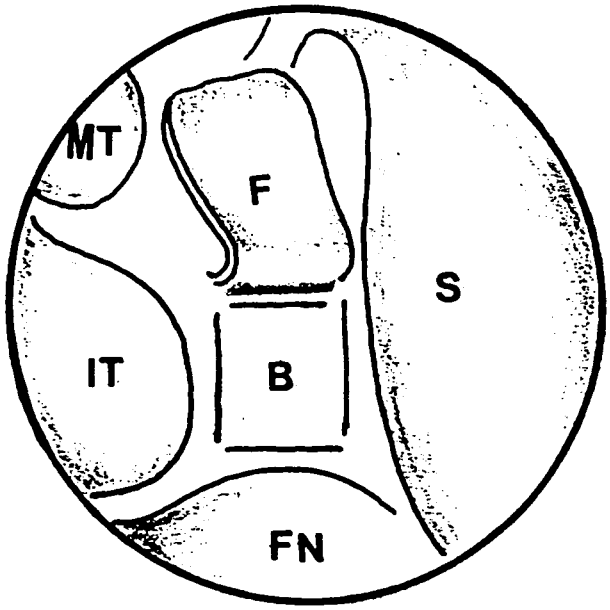

Fig. 3

The bone (B) of the atretic plate was removed under direct endoscopic vision by four chisel cuts (F = nasal mucosal flap, S = septum, FN = floor of the nose, MT = posterior end of middle turbinate, IT = posterior end of inferior turbinate).

Key words: Choanal atresia; Nasendoscopic surgery

Discussion

It has been our belief that the endonasal route is the most direct approach to the choanal atresia. The rigid endoscope in choanal surgery provided an extremely sharp image, with high resolution and bright illumination. It appeared to bring the surgeon's eye to the end of the telescope, with a magnified overview. It enabled the surgeon to see the tips of his instruments so that the bony atretic plate can be removed under direct vision, away from the basisphenoid. It allowed assessment of the size of the created opening, in comparison to the choana of the normal side. It ensured greater precision in flap preservation. The transpalatal incision and its complications were thus avoided, with early recovery and short hospitalization. The technique was short in time and safe. The cases had an uneventful recovery with a long-term patent nasal airway. Again, the technique increased the awareness of the surgeon to endoscopic endonasal surgery. It can be applied in young children using the 2.7 mm telescope and Ritter bougies to perforate the atretic plate. It does not preclude revision surgery by the transpalatal route, especially in very thick, dense atretric plates.

References

Cinnamond, M. J. (1987) Congenital anomalies of the nose. In *Scott-Brown's Otolaryngology* (Evans, J. N. G., ed.), Vol. IV, ch. 15, Butterworths: London. p. 220–222.

English, G. M. (1981) Congenital anomalies of the nose, nasopharynx and paranasal sinuses. In *Otolaryngology* (English, G. M., ed.), Vol. II, ch. 11, Harper and Raw: Philadelphia. p. 11–18.

Pashley, N. R. T. (1986) Congenital anomalies of the nose. In *Otolaryngology, Head and Neck Surgery* (Cummings, C. W. and Krause, C. J., eds), Vol. I, ch. 31, The C. V. Mosby Co.: St Louis. p. 582–584.

Pirsig, W. (1986) Surgery of choanal atresia in infants and children: historical notes and updated review. *International Journal of Pediatric Otorhinolaryngology*, **11:** 153–170.

Wetmore, R. F., Mahboubi, S. (1986) Computed tomography in the evaluation of choanal atresia. *International Journal of Pediatric Otorhinolaryngology*, **11:** 265–274.

Winther, L. K. (1978) Congenital choanal atresia. *Archives of Otolaryngology*, **104:** 72–76.

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